

Comments on “Maintaining Central Bank  
Solvency under New-Style Central Banking” by  
Robert E. Hall and Ricardo Reis

Carl E. Walsh

March 1, 2013

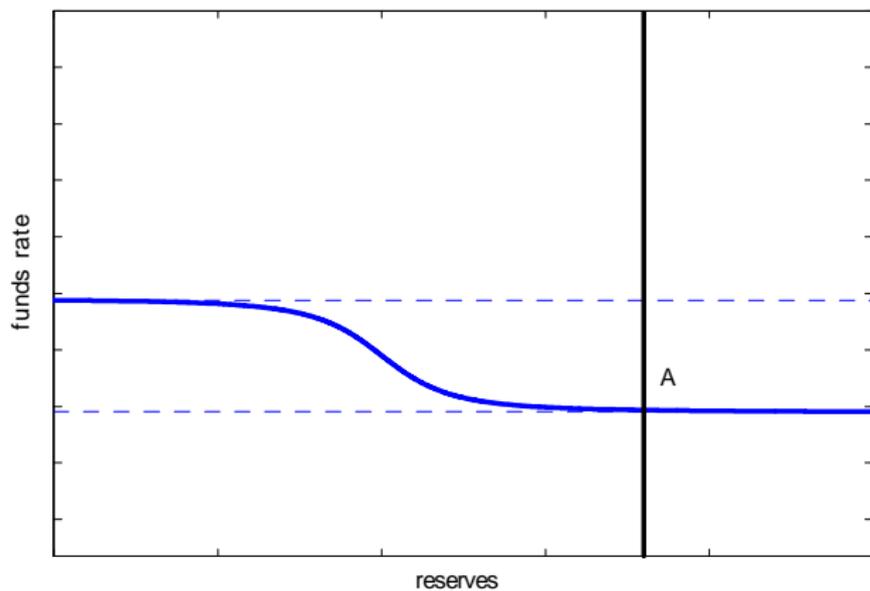
# Overview of paper

1. The authors (in an earlier version) offer a new policy that is designed to achieve price stability – policy emphasizes the role played by the interest paid on reserves.
2. They develop an accounting system to assess central bank solvency.
3. They investigate the potential effects of central bank payments to the Treasury under alternative scenarios for asset prices and interest rates and assess the potential solvency threats to the Federal Reserve and the ECB.

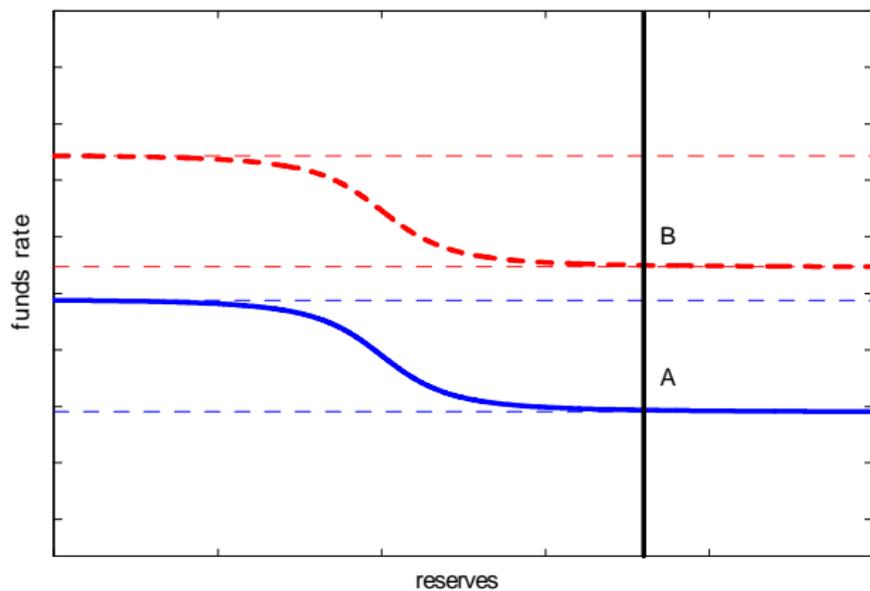
## Authors' conclusions

1. “....the Fed is in no danger of failing to meet its obligations or requiring recapitalization in an economy subject to occasional crises resembling the one that began in 2008. The answer to the question posed at the outset of this paper—is the Fed at risk for losing the ability to stabilize prices because it becomes insolvent?—is an unambiguous no.”
2. “the ECB has an important potential advantage over the Fed because it holds a substantial fraction of its assets as collateralized loans to banks rather than as outright ownership of bonds.....But the ECB is at risk for a meltdown in which the collateral in its repos loses substantial value and the counterparty banks are unable to repay.”

# Modern central banking and monetary policy implementation

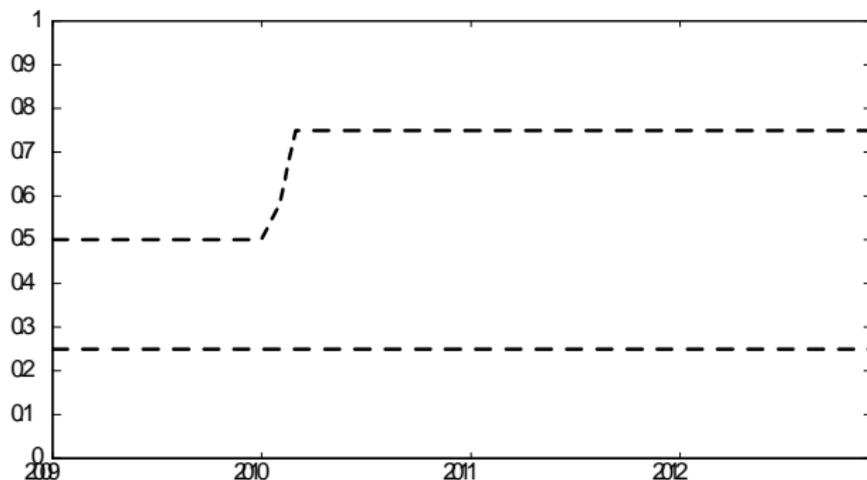


# Modern central banking and monetary policy implementation



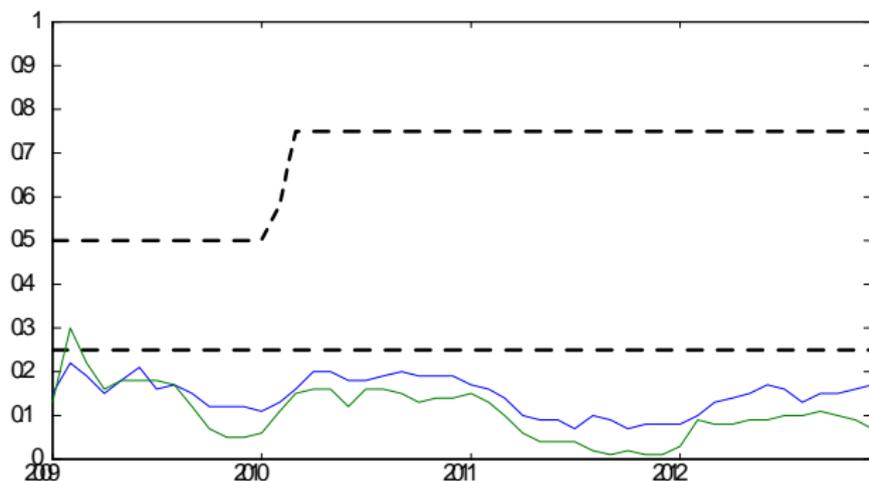
# Modern central banking and monetary policy implementation

- ▶ Instruments: floor, ceiling, quantity of reserves, and the exchange rate between currency and reserves.



**Figure:** The channel: the primary credit rate (upper line) and the interest rate on reserves (lower line), Jan 2009-Dec. 2012

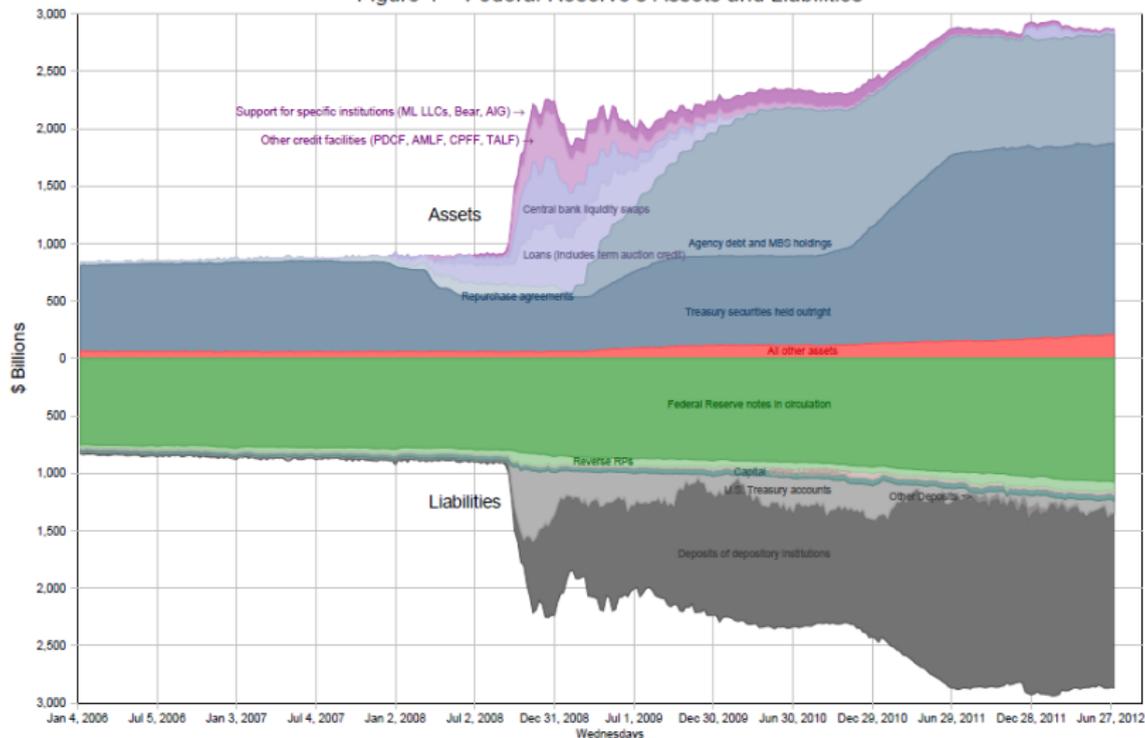
# Modern central banking and monetary policy implementation in practice



**Figure:** The channel: the primary credit rate, the interest rate on reserves, the federal funds rate (blue) and 3-month T-bill rate (green), Jan 2009-Dec. 2012

- ▶ Limits to arbitrage (Bech and Klee 2011, Furfine 2011).

Figure 1 – Federal Reserve's Assets and Liabilities



## Alternative dividend rules

- ▶ When interest rates eventually rise, the Federal Reserve will experience capital losses on its portfolio. Hall and Reis link portfolio losses to the central bank's income statement and explore how alternative rules for paying out dividends to the Treasury affect the solvency of the central bank.
- ▶ Two different rules:
  - ▶ Rule 1: *real mark-to-market dividend equal to net income.* Under this rule,  $V_S - q_S B_S$  is constant, equal to its initial value.
  - ▶ Rule 2: *nominal mark-to-market dividend equal to change in nominal net worth that would occur in the absence of dividends.* Under this rule, nominal net worth of central bank is constant if inflation is zero but converges to zero with positive inflation.
- ▶ Neither captures what the Fed actually does.

## When dividends are negative

- ▶ Either rule may call for negative dividends.
- ▶ In Fed's balance sheet, the value of earnings needed to cover loss are booked as a deferred asset.
- ▶ This has occurred:
  - ▶ Week of November 3, 2011, H.4.1 Table 9: Interest on Federal Reserve notes due to U.S. Treasury was **-\$203 million**.
  - ▶ Week of Feb., 21, 2013, H.4.1 Table 9: Interest on Federal Reserve notes due to U.S. Treasury figure was **+\$998 million**.

# Can the central bank fund dividend payments from assets bought by currency?

- ▶ Central bank's total nominal liabilities equal reserves plus currency:

$$L_{s'}^n = V_{s'}^n + N_{s'}^n$$

- ▶ Nominal net worth evolves according to

$$W_{s'}^n = \left(1 + i_{s'}^b\right) W_s^n + \left(i_{s'}^b - i_s\right) L_s^n + i_s N_s^n - D_{s'}$$

- ▶ Constant nominal net worth dividend rule implies

$$D_{s'} = i_{s'}^b W_s^n + \left(i_{s'}^b - i_s\right) L_s^n + i_s N_s^n$$

- ▶ It might appear that issuing currency and reducing reserves, holding  $L^n$  constant, would allow CB to increase dividend.
- ▶ But given the central bank maintains a fixed exchange rate between currency and reserves, the central bank does not control composition of liabilities.

## When dividends are negative

- ▶ If dividend must remain nonnegative,

$$d_t = \max(\text{net income}, 0).$$

- ▶ Under nominal mark-to-market rule, the shortfall from initial net worth  $W_0$  is

$$Z_t = \left( \frac{1}{1 + \pi_t} \right) Z_{t-1} - \min(0, y_t)$$

- ▶ If  $\pi = 0$ ,  $Z$  drifts up without limit since  $\min(0, y_t) \leq 0$ .
- ▶ Reserves are stationary if  $\pi > 0$  and non-stationary if  $\pi = 0$ .

## Application to the Fed

- ▶ Hall and Reis calculate the behavior of an account balance  $D$  measuring the cumulative negative net income realizations. The balance rises when net income is negative.
- ▶ Dividend rule is assumed to be

$$d' = \max(y' - D, 0)$$

- ▶ They assume an upper limit on  $D$  of  $\bar{D} = 0.02 \times GDP$ .
  - ▶  $D$  declines with inflation if  $\pi > 0$ .
  - ▶ With zero inflation,  $D < \bar{D}$  limit will be violated over an infinite horizon.
- ▶ One measure of the central bank's balance sheet weakness is the inflation that would be needed to maintain reserves on a stationary path.
- ▶ Hall and Reis instead focus on whether  $D < \bar{D}$  for a fixed inflation rate.

## Application to the Fed

- ▶ Scenario takes inflation, the Fed's portfolio, and the real interest rate as given.
- ▶ Estimate 5-state transition probabilities for the ex-post 1-year Treasury rate using annual data, 1954-2011.
- ▶ Only enter crisis from state 1 – high real interest rate state. (Nominal rate in state 1 is 3.9% plus 2% inflation or 6.9%).
- ▶ Assume annual probability of exiting crisis state is 20% per year. Note that this exit probability is independent of Fed policy and/or its balance sheet.
- ▶ Experiment is an enforced 5-year crisis then a recovery to state 3 for four years.

# Application to the Fed

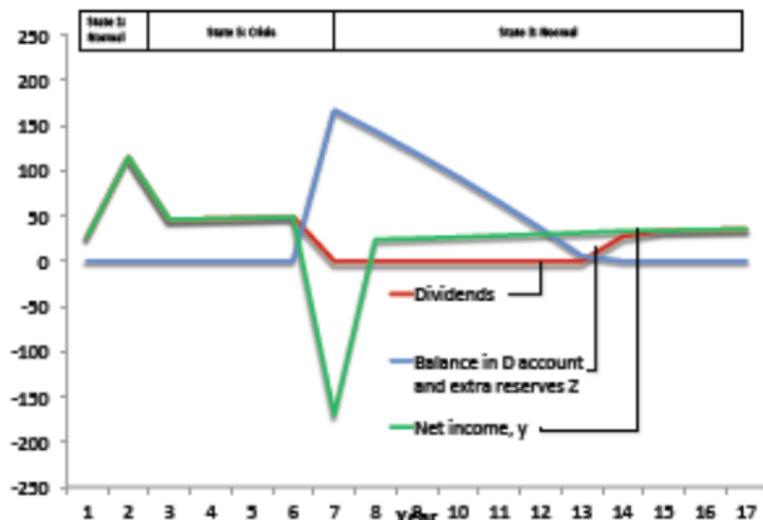


Figure 5: How the *D* Account Generates a Speedy Elimination of Extra Reserves from a Capital Loss

## Application to the Fed: Questions and issues

- ▶ In base scenario, Fed sells 1.8T in bonds. Not clear how the Fed's portfolio decisions of the Fed determined in the scenario.

## Path of assets and liabilities

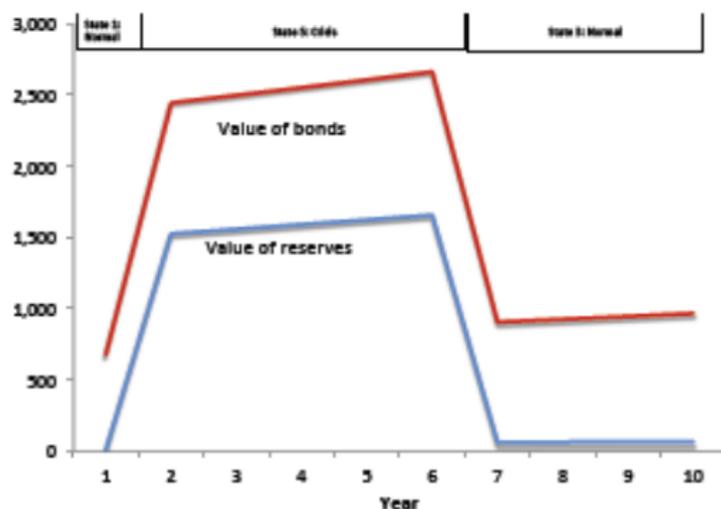
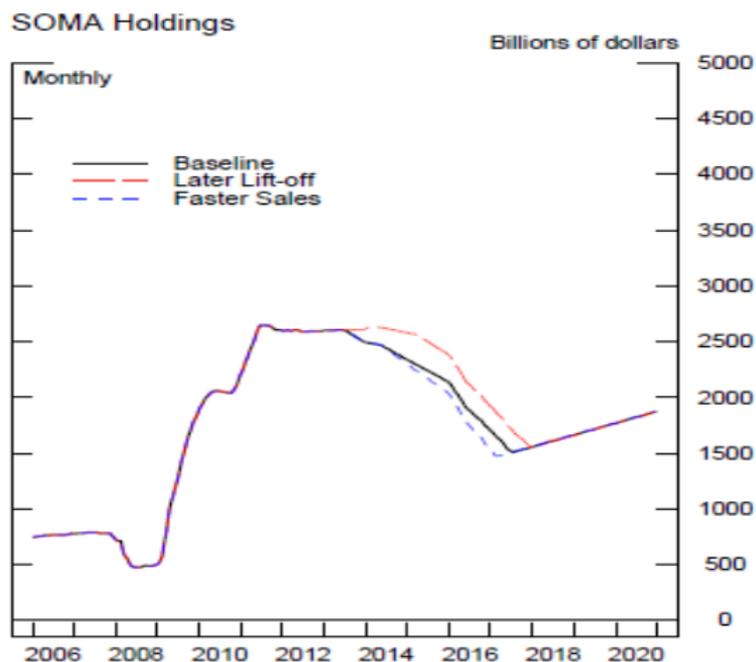


Figure 2: The Values of the Fed's Bond Holdings and Reserves Outstanding, Billions of Dollars

# Carpenter, Ihrig, Klee, Boote, and Quinn (2012)



## Application to the Fed: Questions and issues

- ▶ In base scenario, Fed sells 1.8T in bonds. Not clear how the Fed's portfolio decisions of the Fed determined in the scenario.
- ▶ Transition probabilities for interest rate independent of Fed's balance sheet. If QE affected interest rates, then unwinding QE should also affect interest rates.

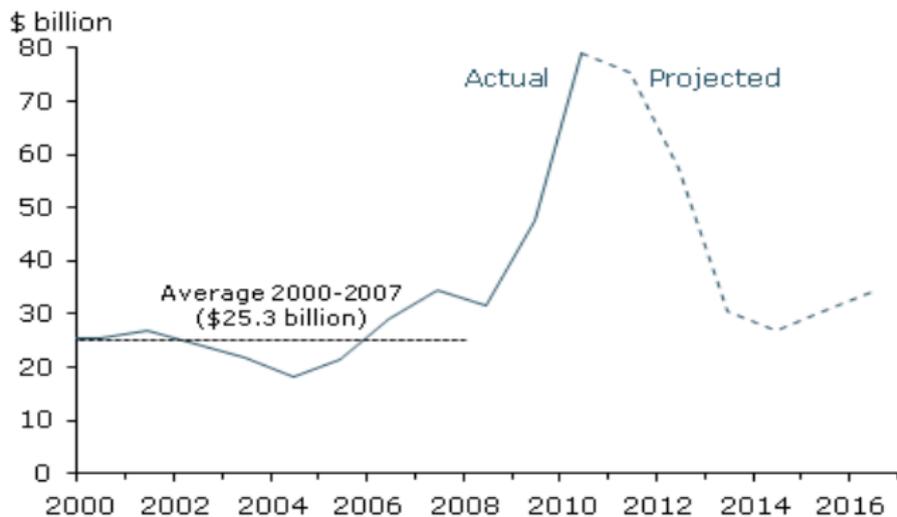
## Application to the Fed: Questions and issues

- ▶ In base scenario, Fed sells 1.8T in bonds. Not clear how the Fed's portfolio decisions of the Fed determined in the scenario.
- ▶ Transition probabilities for interest rate independent of Fed's balance sheet. If QE affected interest rates, then unwinding QE should also affect interest rates.
- ▶ The chosen scenario is extremely unlikely – probability of staying in crisis state for five years is about 40%; probability of four years in state three post-crisis is 3%. Probability of being in states 1 or 2 (with higher rates) over three years post initial exit to state 3 is over 40% so base exercise understates effects on Fed's balance sheet during the four years post crisis.

## Application to the Fed: Questions and issues

- ▶ Over the entire scenario period, inflation is exactly at the Fed's target in all states.
- ▶ If negative dividends threaten central bank independence, and if there is a cost to losing independence, then the central bank may let inflation deviate above target.
  - ▶ Any model of rational policy choice is likely to make inflation state contingent in a way that affects the calculation of solvency.
- ▶ But, expectations of such a deviation in the future will push up long-term rates and move forward the date of negative dividends.

# Dividend projection (Rudebusch 2011, based on NY Fed 2011)



## Is solvency the biggest threat?

- ▶ Contribution of paper – taking a serious and quantifiable look at the question of solvency.
- ▶ But – as authors state, “We take as given inflation, the value and maturity of bonds held by the Fed, and the real interest rate...If the Fed runs into trouble, *it will likely affect at least one of these variables in response.*” (emphasis added)
- ▶ Other threats (perhaps more important) to Federal Reserve’s independence – political.
  - ▶ “Fears at Fed of Rate Payout to Banks.” *Financial Times*, Feb. 18, 2013. “Officials at the US central bank fear it could create a public-relations nightmare after the Fed was lambasted for rescuing banks during the financial crisis.”
- ▶ Divorcing money from monetary policy may not be as easy in practice as it is in theory.